

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Richmond Division**

CALLOS McCALLUM, by his next friends,
DENNIS and CYNTHIA McCALLUM,

Plaintiff,

v.

Civil Action No. 3:04cv442

UNITED STATES OF AMERICA,

Defendant.

MEMORANDUM OPINION

This matter is before the Court on the Defendant United States Of America's Motion *In Limine* To Exclude Certain Of Plaintiff's Experts (Docket No. 37) and the Defendant United States of America's Motion For Summary Judgment (Docket No. 33). Specifically, the United States moves to exclude Dr. James Cisek, M.D., a board certified medical toxicologist, and Dr. Andrew Zimmerman, M.D., a board certified pediatric neurologist.¹

The parties fully briefed the motions, and the Court held a hearing on March 16, 2005. For the reasons set forth below, the motion *in limine* and motion for summary judgment are DENIED.

¹ Although the United States also moves for the exclusion of Dr. Leonard Vance, that part of the motion will be considered in conjunction with the plaintiff's Motion In Limine To Exclude Defendant's Expert, Dr. Robert Golden (Docket No. 49). Because the plaintiff offers Dr. Vance's testimony only to rebut Dr. Golden's, and because the hearing on the Golden motion did not occur until March 31, 2005, the motion in limine with respect to Dr. Vance will not be addressed in this Memorandum Opinion.

BACKGROUND

The McCallum family resided in U.S. Army housing at Fort Lee Virginia. On October 9, 1995, Paul Saunders ("Saunders"), a certified pest control applicator employed by the Army, sprayed the interior of the McCallum residence with an organophosphate pesticide, Safrotin.

This interior spraying occurred after Cynthia McCallum made repeated calls to the pest control office to complain about ant infestation. After being greeted at the door by then Army Captain Dennis McCallum, the plaintiff's father, Saunders sprayed Safrotin in several areas of the McCallum residence identified by Captain McCallum as the points of ant infestation. The Safrotin was applied, inter alia, along the baseboards and near the ventilation outlets in three-year-old Callos McCallum's bedroom. Several of Callos McCallum's toys were located on the floor near the baseboards when the spraying occurred.

Saunders asserts that he "spot sprayed" light amounts of Safrotin along the baseboards inside the McCallum residence. Further, Saunders testified that most of the spraying occurred outside of the residence, around the perimeter of the house and near an ant-infested tree. Captain McCallum disputes that contention, asserting that he witnessed Saunders spray continuously along the baseboards and in other areas of the residence.

During the early morning hours of October 12, 1995, three days after the Safrotin application, Callos McCallum suffered a seizure

and respiratory arrest. Subsequently, his parents rushed him to the emergency room at Fort Lee. Shortly thereafter, the doctor's at Fort Lee transferred McCallum to the pediatric intensive care unit at the Medical College of Virginia in Richmond, where he remained hospitalized until October 19, 1995.

In this action, plaintiff contends that Callos McCallum suffers from a permanent seizure disorder caused by Safrotin poisoning. The United States disputes this claim, arguing that, in fact, Callos McCallum was not exposed to enough Safrotin to have been poisoned. Instead, the defendant contends that the plaintiff's October 1995 seizure and the current seizure disorder stem from a seizure disorder that pre-dated the exposure to Safrotin.

DISCUSSION

A. Motions In Limine

The plaintiff offers the testimony of Dr. Cisek and Dr. Zimmerman to prove that Callos McCallum's seizure disorder is the result of Safrotin poisoning and not, as the United States contends, the consequence of a preexisting seizure disorder. Both Dr. Ciskek and Dr. Zimmerman employed differential diagnoses to reach their opinions that Safrotin poisoning was the cause of Callos McCallum's condition.

Pursuant to Federal Rule of Evidence 702, district judges act as gatekeepers to "ensure that any and all scientific testimony is . . . not only relevant, but reliable." Daubert v. Merrell Dow

Pharmaceuticals, Inc., 509 U.S. 579, 588 (1993). Expert opinion testimony is admissible under Rule 702 if it "concerns (1) scientific, technical, or other specialized knowledge that (2) will aid the jury or other trier of fact to understand or resolve a fact at issue." Westberry v. Gilsclaved Gummi AB, 178 F.2d 257, 260 (4th Cir. 1999). Therefore, in assessing the admissibility of expert testimony, the court must conduct a two-part analysis. Id. First, it is necessary to determine whether the reasoning and/or methodology underlying the expert's opinion is supported by an adequate scientific foundation - in other words, that it is reliable. Id. Second, if an adequate foundation exists, it is necessary to determine whether the opinion is relevant. Id.

In Daubert, the Supreme Court identified several factors that district courts should consider in assessing the reliability of an expert's opinion. See 509 U.S. at 592-94. They are: (1) whether a theory can be or has been tested; (2) whether the theory has been subjected to peer review and publication; (3) whether the theory has a high known or potential rate of error and whether there are standards controlling its operation; and (4) whether the theory or technique enjoys general acceptance within the scientific community. See also Cooper v. Smith, 259 F.3d 194, 199 (4th Cir. 2001). Although some or all of these factors may be helpful to the district court, this list is neither definitive or exhaustive. Id. (citing Kumho Tire Co. v. Carmichael, 526 U.S. 137, 150 (1999)).

Ultimately, "the court has broad latitude to consider whatever factors bearing on validity that the court finds to be useful; the particular factors will depend on the unique circumstances of expert testimony involved." Westberry v. Gilsaved Gummi AB, 178 F.2d 257, 261 (4th Cir. 1999).

Also, it is necessary to consider the so-called "fit" of the expert evidence to the specific case. In other words, the Court must assure that the expert evidence is tethered to the facts of the case so that it will actually assist the jury in discharging its fact finding duty. "Fit," an aspect of relevance, is a means of connecting the scientific principles to the facts of the case at hand. Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 596 (1993).

The Fourth Circuit has explained that, in exercising the gatekeeping function, district courts should be mindful of "two guiding, and sometimes competing, principles." Id. First, the courts must recognize "that Rule 702 was intended to liberalize the introduction of relevant expert evidence." Id. In that respect, the court need not be certain that the testimony "is irrefutable or certainly correct." Id. "As with all other admissible evidence, expert testimony subject to being tested by 'vigorous cross examination, presentation of contrary evidence, and careful instruction on the burden of proof.'" Id. (quoting Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 596 (1993)). On the other hand, the district court must appreciate that, because of

the sophisticated nature of an expert's testimony - especially a scientific expert - the witness has the potential to be not only persuasive, but also misleading. See id. In that respect, "proffered evidence that has a greater potential to mislead should be excluded." Id.

In Westberry, the Fourth Circuit recognized that differential diagnosis is "a standard scientific technique of identifying the cause of a medical problem . . . by determining the possible causes for the patient's symptoms and then eliminating each of these potential causes until reaching one that cannot be ruled out or determining which of those that cannot be excluded is the most likely." 178 F.3d at 262. A reliable differential diagnosis "typically, though not invariably, 'is performed after physical examinations, the taking of medical histories, and the review of clinical tests, including laboratory tests.'" Cooper v. Smith, 259 F.3d 194, 199 (4th Cir. 2001) (quoting Westberry, 178 F.3d at 263). However, an expert's failure to conduct a physical examination does not render the opinion unreliable, especially when the expert consults with the plaintiff's treating physician. See id. at 203.

Although the goal of differential diagnosis is to systematically rule out all but one potential cause of a particular malady, the Supreme Court and the Fourth Circuit have made it clear that it is not always possible to achieve that objective. Accordingly, "[a] medical expert's opinion based upon differential diagnosis normally should not be excluded because the expert has

failed to rule out every possible alternative cause of a plaintiff's illness." Id. at 202. Thus, it is critical to distinguish between a situation in which the expert fully considers alternative causes but ultimately rejects them and a situation in which the expert refuses even to entertain those alternatives. See id. Ultimately, a reliable differential diagnosis opinion will entail some consideration of the alternative causes posited by the defendant and cite some basis for rejecting those alternatives. See id.

Unlike most toxic exposure cases, in which the experts employ the differential diagnosis techniques to consider, and systematically to exclude, a host of possible causes, this case presents the unusual scenario in which everyone agrees that there are only two possible causes: a preexisting seizure disorder or organophosphate poisoning. Both Dr. Cisek and Dr. Zimmerman opine that McCallum's current seizure disorder was caused by the latter. In order for Dr. Cisek and Dr. Zimmerman's opinions to be deemed reliable, therefore, the Court must find that both experts fully considered the possibility of a preexisting seizure disorder and that they cited an adequate medical basis for rejecting that alternative.

1. Dr. Cisek

As noted above, the plaintiff intends to call Dr. Cisek, a board certified medical toxicologist from Johns Hopkins University, to opine that Callos' McCallum's present seizure disorder was

caused by the October 1995 Safrotin poisoning. Dr. Cisek employed the differential diagnosis technique to reach this conclusion.

The United States first argues that Dr. Cisek's expert report did not provide an adequate basis for his opinion and thus that Dr. Cisek's opinion fails to satisfy Fed. R. Civ. P. 26(a)(2)(B). Specifically, the United States contends that Dr. Cisek failed to explain **in his report** how and why some of the medical evidence in this case did not point to a preexisting seizure disorder. Although the United States concedes that Dr. Cisek later explained at his deposition how he was able to rule out preexisting seizure disorder, the defendant contends that his failure to do so in the report renders his opinion unreliable. For that reason, the United States contends that the witness should be excluded.

Next, the United States takes the position that Dr. Cisek should be barred from testifying because he did not apply established principles and methods of toxicology. Instead, the defendant asserts that Dr. Cisek relied solely on his past clinical experiences and observations, while disregarding pertinent medical history and test results. In arguing that Dr. Cisek's opinion is unreliable, the United States asserts that his conclusion is at odds with overwhelming medical evidence. The United States contends that, at the most, Dr. Cisek only conducted a cursory review of Callos McCallum's MCV blood, urinalysis, and EEG test results. Had he fully reviewed and credited that medical evidence,

the defendant argues, Dr. Cisek would not have been able to reach his conclusion with respect to Safrocin poisoning.

Neither contention is meritorious. Each is addressed in turn.

First, Dr. Cisek's report made sufficient reference to the pertinent medical records in his report. Although Dr. Cisek did not fully explain how each of those references supported his opinion, he did cite those records as central to his conclusion that Callos McCallum was poisoned. The report could have been more specific in explaining, in lay terms, the significance of the references made therein to the patient's breathing difficulties, excessive oral secretions, and normal EEG, and how those recorded symptoms indicated organophosphate poisoning and how those symptoms led Dr. Cisek to rule out preexisting seizure disorder and rule in Safrocin poisoning. However, it is clear that counsel for the United States and their experts understood the significance of the observations and statements made by Dr. Cisek in his report. Indeed, counsel for the United States made no motion to exclude Dr. Cisek as a witness after receiving his amended report and, in fact, counsel conducted a fulsome and thorough examination of Dr. Cisek at deposition. Also, the experts for the United States were able to assess Dr. Cisek's opinions and to respond to them. On this record, and considering the text of Dr. Cisek's report against his deposition testimony, the Court concludes that the report satisfied the requirements of Fed. R. Civ. P. 26(a)(2)(B).

Turning to the United States' second argument, the Court finds that Dr. Cisek applied established principles and methods of toxicology in reviewing the available medical evidence and in concluding that Callos McCallum's current seizure disorder was caused by the October 1995 Safrotin exposure, and not by a preexisting seizure disorder. In his report, Dr. Cisek noted that he considered: (1) Callos McCallum's emergency department records from Kenner Army Community Hospital; (2) MCV hospital records from the transport team, pediatric intensive care unit, neurologists, nurses, and other health care professionals; and (3) six peer-reviewed medical journal articles relating to organophosphate exposure. Amended Report of James E. Cisek, M.D., November 11, 2004, at 1, Def.'s Ex. D ("Cisek Report at ____"). Based on his review of Callos' medical history, the relevant studies and journal articles, and his extensive clinical experience, Dr. Cisek concluded that "this clinical presentation is classic for a child poisoned with an organophosphate." Cisek Report at 3.

At deposition, Dr. Cisek testified that initially he considered a preexisting primary seizure disorder as a possible cause. See Cisek Dep. at 30, Pl's Ex. 1 (Cisek Dep. at ____). However, an extensive review of the medical records relating to Callos' physical symptoms led Dr. Cisek to rule out that possible alternative cause. See Cisek Dep. at 77. In so doing, Dr. Cisek noted what, in his mind, was a key fact - that, at one point when the boy was first brought to the hospital at Fort Lee, he had

stopped breathing. Because it is very uncommon for people with primary seizure disorder to stop breathing, Dr. Cisek stated that this medical evidence cut diagnosing against a primary seizure disorder. See id. Further, Dr. Cisek noted that the medical records showed that Callos had excessive pulmonary secretions. Because excessive secretions are "far less common" in primary seizure disorder patients, Dr. Cisek considered that evidence to have undermined the alternative theory of a preexisting seizure disorder. Id. at 73-75. Finally, Dr. Cisek pointed out that, in ruling out the possibility of primary seizure disorder, he found persuasive the notations made by the primary attending neurologist, Dr. Leshner, which reflected normal EEG readings. Dr. Leshner noted that the EEG indicated diffuse slow wave activity with no epileptiform discharges, and that helped lead to Dr. Cisek's decision to rule out a primary seizure disorder.

The United States argues that the result of blood serum demonstrates that Callos was not poisoned. Dr. Cisek explained why the results of Callos McCallum's blood serum, which were negative for the organophosphate poisoning, were not dispositive on the poisoning issue. For example, Dr. Cisek explained that organophosphates, like Safrothin, tended to inhibit the body's production of acetylcholinesterase (cholinesterase) which can be measured by blood serum testing. That sampling was conducted shortly after Cassos McCallum was admitted there. In his report

and again during his deposition, Dr. Cisek opined that Callos McCallum's blood serum test results, which showed cholinesterase levels within a "low normal" range, were misleading for two reasons. First, Dr. Cissek explained that, immediately after being admitted to MCV, Callos had been treated with Pralidoxime, a cholinesterase-boosting drug. Cisek Report at 3. Second, Dr. Cisek cautioned that, based on his experiences as a medical toxicologist, normal cholinesterase levels vary widely among children, and, therefore, to say that a single test result puts someone in a universal normal range is misleading. According to Dr. Cisek, serum cholinesterase tests are only reliable if multiple tests are conducted, and the particular patient's normal range is ascertained. According to Dr. Cisek, multiple blood serum tests were not conducted, and, thus, no normal range was established for Callos McCallum. Hence, Dr. Cisek discounted the result from the single serum cholinesterase test as evidence that organophosphate poisoning had not occurred.

Finally, the defendant argues that Dr. Cisek ignored the results of a urinalysis screen. Although the urinalysis screen showed negative results for the presence of twenty-one types of organophosphates, the test did not actually screen for Safrothin. See Pl.'s Ex. 10. For that reason, Dr. Cisek did not credit the urinalysis as evidence that organophosphate poisoning had not occurred.

Dr. Cisek is a board-certified toxicologist with vast experience in treating children poisoned by organophosphates. In rendering his opinion in this case, Dr. Cisek relied on that experience, on an extensive review of Callos McCallum's medical records, and on several peer-reviewed studies regarding organophosphate poisoning. Dr. Cisek fully considered the possibility of a preexisting seizure disorder and provided a sound medical basis for ultimately rejecting that alternative cause.

It is evident from Dr. Cisek's report and his extensive deposition testimony that Dr. Cisek's conclusions were the product of a reliable differential diagnosis. Further, Dr. Cisek's testimony "fits" the unique facts of this case.

Dr. Cisek's testimony is both relevant and reliable.

For the foregoing reasons, the defendant's motion *in limine* to exclude Dr. Cisek's testimony is DENIED.

2. Dr. Zimmerman

The Defendant also moves to exclude the expert testimony of Dr. Andrew Zimmerman, a board certified pediatric neurologist from Johns Hopkins University, arguing that Dr. Zimmerman failed to demonstrate how, in the process of conducting his differential diagnosis, he was able to rule out a preexisting seizure disorder. According to the United States, Dr. Zimmerman's report is devoid of any discussion relating to the medical evidence of a preexisting seizure disorder. The Defendant argues that Dr. Zimmerman's

exclusion of this "obvious alternative cause" is unfounded, rendering his overall methodology unreliable.

In his report, Dr. Zimmerman recited that he had treated Callos McCallum for the past eight years. Zimmerman Report at 1. During that course of treatment, Dr. Zimmerman has: (1) taken the medical histories of Callos McCallum's parents; (2) reviewed Callos McCallum's medical records from the other health care providers; (3) reviewed various tests and studies; and (4) conferred with other health care providers, including two of McCallum's other doctors, Dr. Leshner at MCV and Dr. Bogrov at Johns Hopkins. See Amended Report of Andrew W. Zimmerman at 4-6, Def.'s Ex. C ("Zimmerman Report at ____"). Additionally, Dr. Zimmerman explained that he has reviewed numerous journal articles and published studies, some of which he admits were provided by lawyers for the Plaintiff. Zimmerman Report at 2. Based on his personal knowledge of the patient and on the review of all of this information and on his "training and experience in the field of neurology and . . . familiarity with the clinical presentation of organophosphate toxicity," Dr. Zimmerman ruled out a preexisting seizure disorder and concluded that the plaintiff's current seizure disorder was caused by organophosphate poisoning. Id.

The United States' assault on Dr. Zimmerman's conclusion is premised on the notion that the physicians who treated Callos McCallum at MCV definitively ruled out organophosphate poisoning as

the cause of the seizure episode they had observed. That premise simply is not correct.

To begin, Dr. Leshner, who was Callos' attending physician at MCV, asserted that the MCV physicians **never excluded organophosphate poisoning** as a potential cause. See Affidavit of Robert T. Leshner, M.D. at 1, Pl.'s Ex. 17 ("Leshner Aff. at__") (emphasis added). And, as the plaintiff correctly points out, there are several references to poisoning throughout the records. Moreover, the MCV discharge summary, Dr. Leshner lists organophosphate exposure as the principal diagnosis. See Pl.'s Ex. 11.

In an effort to skirt this strong evidence supporting Dr. Zimmerman's opinion, the United States asserts that Dr. Zimmerman failed adequately to consider the two specific references in the MCV records, which, it contends, are consistent with a preexisting seizure disorder: a "staring spell" and a "limb stiffening" episode. In making this argument, the United States relies on cryptic references buried within the MCV records. Most of these references are contained in Dr. Leshner's patient progress notes written on the day that McCallum was admitted to MCV. In his notes, Dr. Leshner recites that, at some earlier time, Callos' parents described a "staring spell in light sleep" and "a four limb stiffening in infancy." However, Dr. Leshner went on to note that there is **"no definite seizure disorder."** See Pl.'s Ex. 23

(emphasis added). And, of course, the discharge summary, which also was written by Dr. Leshner, makes no mention of a preexisting seizure disorder. See Pl.'s Ex. 11.

At his deposition, Dr. Zimmerman dismissed the notion that the references to the limb stiffening and staring episodes proved that Callos had a preexisting seizure disorder. Because the reported staring spell was not accompanied by other physiologic signs, such as eye fluttering, head nodding, or abdominal pain, Dr. Zimmerman concluded that the staring spell was not an indication of a preexisting neurological disorder. As for the limb stiffening episode, Dr. Zimmerman testified that, in a child, a seizure does not occur "just with four limbs stiffening." Deposition of Andrew Zimmerman, M.D. at 107, Pl.'s Ex. 6 (Zimmerman Dep. at __"). Dr. Zimmerman asserted that the limb stiffening likely was attributable to a bowel movement. Zimmerman Dep. at 49.

Next, the United States contends that Dr. Zimmerman disregarded the results of a 1996 MRI exam. Again, this assertion is largely unfounded. In his report, Dr. Zimmerman noted that the 1996 MRI showed "normal" results. Later in the report, Dr. Zimmerman cited the results of an 1999 MRI, which showed temporal lobe injuries and calcification on the right side of McCallum's brain. Based on the disparity in the MRI reports, Dr. Zimmerman concluded that McCallum did not have a preexisting seizure disorder. In Dr. Zimmerman's opinion, if Callos had suffered from

a preexisting seizure disorder, the 1996 MRI would have shown some abnormality. Because no abnormality was evident until 1999, Dr. Zimmerman concluded that there was no preexisting disorder. See Zimmerman Report at 5. The United States takes issue with Dr. Zimmerman's characterization of the 1996 MRI as normal.

The disagreement on this issue is complicated by the fact that the complete 1996 MRI records have never been located. The only records relating to the 1996 MRI are a discharge summary and a half page of handwritten notes from McCallum's hospital records. On the one hand, the discharge summary expressly recites that Callos McCallum's "head computerized topography scan [was] normal." See Pl.'s Ex. 29. However, the United States points to a handwritten phrase "? R side temporal abnormality, calcium vs artifact." Pl.'s Ex. 30. As the plaintiff points out, these notes are dubious for two reasons. First, because the entire 1996 MRI records have not been recovered, neither party knows who the author of the handwritten notes was. Second, to the extent that the notes can be read to suggest that the MRI showed an abnormality, that finding directly contradicts the conclusion in the discharge summary that the MRI was normal.

These conflicting references create a genuine issue with respect to a preexisting abnormality. However, what is important in resolving this motion *in limine* is that Dr. Zimmerman had a

sufficient medical basis, e.g., the discharge summary, in forming his opinion.

Finally, the United States asserts that Dr. Zimmerman disregarded the results of a 1995 EEG test, which the United States contends indicated signs of a preexisting seizure disorder. This contention is not supported by the record. First, it is important to note that Dr. Zimmerman actually considered the 1995 EEG in his report. See Zimmerman Report at 5. Second, during his deposition, Dr. Zimmerman explained that, contrary to the Defendant's interpretation, the sharp waves on the temporal sides were not the result of a preexisting seizure disorder, but, rather, an anoxic injury attributable to the organophosphate poisoning. See Zimmerman Dep. at 113-14. Clearly, the United States is in error in asserting that Dr. Zimmerman failed to consider the report. Moreover, that he considered but rejected the significance of the report is not ground to preclude the opinion.

In sum, Dr. Zimmerman's opinion is derived from a reliable differential diagnosis. Dr. Zimmerman fully considered the medical evidence that the United States argues points to a preexisting seizure disorder. Dr. Zimmerman had an adequate medical basis for his opinion on Safrotin poisoning and fully discussed why the medical evidence supported that opinion. Further, his scientific testimony also "fits" the facts of this case.

Dr. Zimmerman's report is adequate and his opinions are reliable and relevant. Therefore, the United States' motion *in limine* with respect to Dr. Zimmerman also will be DENIED.

B. Motion For Summary Judgment

The United States takes the position that, even if its motion *in limine* with respect to Dr. Cisek and Dr. Zimmerman is denied, summary judgment is appropriate because the plaintiff cannot prove that Callos McCallum was exposed to harmful levels of Safrocin.

In its memorandum in support of summary judgment, the United States correctly asserts that the plaintiff must prove both general and specific causation. The United States concedes that the plaintiff satisfied his burden with respect to general causation - that at some level, exposure to Safrocin is harmful to humans. However, the United States takes the position that McCallum cannot prove specific causation. According to the United States, McCallum cannot meet this burden because he does not have any medical or other scientific evidence demonstrating that the plaintiff was exposed to harmful levels of Safrocin.

The plaintiff cites the principal Fourth Circuit decision on this issue, Westberry v. Gislaved Gummi AB, 178 F.3d 257 (4th Cir. 1999), for the proposition that an opinion based on differential diagnosis alone is sufficient to prove specific causation. In other words, the plaintiff argues that, even without dose-response exposure data, the expert opinions of Dr. Ciskek and Dr. Zimmerman

are sufficient to create a genuine issue of material fact with respect to specific causation.

1. Summary Judgment Standards

The standards applicable to summary judgment motions are well-established. Summary judgment is proper only when there are no genuine issues as to any material facts and the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(c). See also Celotex Corporation v. Catrett, 477 U.S. 317, 322 (1986). Summary judgment is not a disfavored procedural shortcut but rather an integral part of the Federal Rules of Civil Procedure, designed to secure the just and expeditious resolution of every civil matter. Graham v. Pactiv Benefits Committee, 301 F. Supp. 2d 483, 491-492 (E.D. Va. 2004).

In reviewing a motion for summary judgment, a court must view the facts and any inferences drawn from these facts in the light most favorable to the nonmoving party. See Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574, 587 (1986); Nguyen v. CNA Corporation, 44 F.3d 234, 236 (4th Cir. 1995). A fact is material when proof of its existence or nonexistence would affect the outcome of the case, and an issue is genuine if a reasonable jury might return a verdict in favor of the nonmoving party on the basis of such issue. Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248 (1986). The nonmoving party is entitled to have its version of all that is disputed accepted, to have all conflicts resolved in its

favor, and to have the benefit of all favorable legal theories invoked by the evidence. M&M Medical Supplies and Service, Inc. v. Pleasant Valley Hospital, Inc., 981 F.2d 160, 163 (4th Cir. 1992). The party who bears the burden of proof on an issue at trial, however, cannot survive summary judgment without sufficient evidence to sustain his or her burden of proof on that point. Celotex, 477 U.S. at 327. These precepts and standards govern the resolution of the Defendant's motion.

2. Assessment of the Substantive Issue

Normally, in order to prove causation in a toxic exposure case, the plaintiff - through his expert - must "identify a dose-response relationship for a particular chemical (or chemical mixture) and illness and analyze the results to determine whether the duration and concentration of exposure in a given instance could have caused the alleged harms." Cavallo v. Star Enter., 892 F. Supp. 756, 764 (E.D. Va. 1995). A dose-response relationship is defined "[a] relationship in which a change in amount, intensity, or duration of exposure to an agent is associated with a change - either an increase or decrease - in risk of disease." Federal Judicial Center, Reference Manual On Scientific Evidence 390 (1994) Establishing a dose-response relationship necessarily entails satisfying a two-prong evidentiary burden. First, the plaintiff must prove that a particular chemical is harmful to human beings generally. See id. at 392. This is known as general causation.

Second, the plaintiff must establish that exposure to the potentially harmful agent actually caused his condition. This second element is known as specific causation.

To satisfy the second element, a plaintiff in a toxic exposure case, ideally, will present some evidence of dose-response relationship. However, proof of a specific dose-response relationship is not "essential . . . evidence that the relationship between an agent and disease is causal." Id. at 377. Indeed, in Westberry, the Fourth Circuit recognized the difficulties associated with proving general and specific causation in cases where dose-response evidence is not available:

[O]nly rarely are humans exposed to chemicals in a manner that permits a quantitative determination of adverse outcomes. . . . Human exposure occurs most frequently in occupational settings where workers are exposed to industrial chemicals like lead or asbestos; however, even under these circumstances, it is usually difficult, if not impossible, to quantify the amount of exposure.

178 F.2d 257, 263-64 (4th Cir. 1999) (citing Federal Judicial Center, Reference Manual On Scientific Evidence 187 (1994)). Thus, "while precise information concerning the exposure necessary to cause specific harm to humans and exact details pertaining to the plaintiff's exposure are beneficial, such evidence is not always available, or necessary, to demonstrate that a substance is toxic to human beings given substantial exposure and need not invariably provide the basis for an expert's opinion on causation." Id.

Accordingly, the Fourth Circuit recognized that, in some cases, "a temporal relationship between exposure to a substance and the onset of a disease or a worsening of symptoms can provide compelling evidence of causation." Id. at 265.

In Westberry, the plaintiff, a rubber gasket cutter, sued his employer, a gasket manufacturer, for damages that he suffered as a result of being exposed to high concentrations of airborne talc.² Id. at 260. Specifically, the plaintiff contended that the manufacturer's failure to warn him of the dangers of breathing airborne talc caused the aggravation of a preexisting sinus condition. Id. In support of this assertion, the plaintiff presented the testimony of his treating physician, who, **on the basis of differential diagnosis alone**, opined that the sinus problems were caused by talc inhalation. Id. The plaintiff presented no other evidence on the causation issue. Although the defendant moved the for the exclusion of this witness and for summary judgment, the district court denied the motions and let the case go to a jury. Accordingly, the jury found for the plaintiff.

On appeal, the defendant argued that the plaintiff's expert should have been excluded because his opinion had been based solely on differential diagnosis. In addition, the defendant argued that, even assuming that an opinion based on differential diagnosis may

² The manufacturer coated the slick rubber gaskets with a talcum powder lubricant to facilitate handling.

sometimes suffice to prove causation, the plaintiff's expert's opinion did not. Id. at 263. Specifically, the defendant argued that Westberry's expert could not have "ruled in" talc exposure because "he had no means of accurately assessing what level of exposure was adequate to produce sinus irritation." Id. Further, the defendant argued that the plaintiff's expert had failed in his burden of proof with respect to specific causation, because the expert had been unable to demonstrate the specific amount of talc that the plaintiff had been exposed to. Id. at 264.

With respect to the general causation issue, the Fourth Circuit found that the plaintiff had satisfied his burden. Even though the expert had been unable to point to any studies showing a correlation between talc exposure and sinus irritation generally, the court found that the defendant had conceded that exposure to high levels of airborne dust - including talc - could cause such irritation. See id. at 265. As for specific causation, the Court of Appeals noted that, even without dose response evidence of harmful talc exposure, the plaintiff's expert had a reliable basis for opining that Westberry had been exposed to harmful levels. See id. Accordingly, the Court held that the opinion was sufficient evidence to satisfy the specific causation burden for two principal reasons. See id. First, the Court noted that the expert had relied on the detailed accounts provided by the plaintiff regarding the nature and level of his talc exposure. Second, the Court found

that the expert had relied, in part, on the strong temporal relationship between the plaintiff's exposure and the onset and/or worsening of his sinus symptoms. Id. Although this temporal relationship was not enough, by itself, to provide a basis for the expert's opinion, the court concluded that, when combined with the plaintiff's detailed account of the talc-laden work environment, there was sufficient evidence of causation. See id.

As in Westberry, the temporal relationship between the exposure and the onset of McCallum's symptoms is significant. The McCallum residence was sprayed with the organophosphate pesticide, Safrotin, on October 9, 1995. Three days later, during the early morning hours of October 12, the plaintiff exhibited virtually every known symptom associated with organophosphate poisoning: (1) respiratory failure; (2) epileptic seizure activity; (3) excessive salivation; (4) persistent high blood pressure; (5) lethargy; and (6) muscle weakness. Although the United States contends that McCallum demonstrated some these symptoms on one or more occasions before October 1995 and, therefore, that there is no significant temporal relationship, for the purposes of the present motion, the Court must view the facts and the inferences drawn from those facts in the light most favorable to the plaintiff. Quite clearly, there was a significant temporal relationship between alleged exposure and the onset of symptoms.

In addition to the temporal relationship, the plaintiff's father, Major McCallum, testified that he witnessed the pesticide applicator, Paul Saunders, spray continuous streams of Safrotin inside the residence, including in Callos' bedroom and near his toys. The Army's pest control applicator, Saunders, testified that he only "spot sprayed" certain areas with light amounts of Safrotin, and thus his version of events does not comport with McCallum's. However, viewing the facts and the permissible inferences in the light most favorable to the nonmoving party, the Court finds that there is evidence that significant amounts of Safrotin were sprayed inside the home and in areas proximate to Callos McCallum.

In sum, combining this strong temporal relationship and Major McCallum's testimony respecting the nature and quantum of Safrotin spraying, the record creates, even without specific dose-response data, a genuine issue of material fact with respect to specific causation. That evidence is augmented by expert testimony on causation.

For the foregoing reasons, the defendant's motion for summary judgment is DENIED.

CONCLUSION

For the foregoing reasons, the defendant's motion *in limine* is DENIED with respect to Dr. Cisek and Dr. Zimmerman. Further, the defendant's motion for summary judgment is DENIED.

The Clerk is directed to send a copy of this Memorandum Opinion to all counsel of record.

It is so ORDERED.

United States District Judge

Richmond, Virginia
Date: _____

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Richmond Division**

CALLOS McCALLUM, by his next friends,
DENNIS and CYNTHIA McCALLUM,
Plaintiff,

v.

Civil Action No. 3:04cv442

UNITED STATES OF AMERICA,
Defendant.

ORDER

For the reasons set forth in the accompanying Memorandum Opinion, it is hereby ORDERED that the Defendant United States of America's Motion *In Limine* To Exclude Certain Of Plaintiff's Experts (Docket No. 37) is DENIED with respect to Dr. Cisek and Dr. Zimmerman. Further, the Defendant United States of America's Motion For Summary Judgment (Docket No. 33) is DENIED.

The Clerk is directed to send a copy of this Order to all counsel of record.

It is so ORDERED.

/s/

Robert E. Payne
United States District Judge

Richmond, Virginia
Date: _____